

**WE CLAIM:**

1. A method of preparing a chitin film comprising the steps of:
  - (a) coagulating a chitin solution to form a chitin gel;
  - (b) pressing the chitin gel to form a chitin film;
  - (c) removing residual solvent from the chitin film under press; and
  - (d) washing the chitin film.
2. The method according to claim 1 further comprising the step of dissolving chitin in a solvent to form the chitin solution.
3. The method according to claim 2 wherein the concentration of chitin in the chitin solution is about 0.2 to 0.8%.
4. The method according to claim 3 wherein the solvent is 5% LiCl/DMAc.
5. The method according to claim 4 wherein the concentration of chitin is 0.5%.
6. The method according to claim 5 further comprising the step of casting the chitin solution prior to the step of coagulation.
7. The method according to claim 1 wherein the chitin solution is coagulated as chitin becomes insoluble with the uptake of moisture.
8. The method according to claim 7 wherein the chitin solution is coagulated at a relative humidity of about 40 to 100%.
9. The method according to claim 8 wherein the chitin solution is coagulated at a temperature of about 10 to 45° C.
10. The method according to claim 9 wherein the chitin solution is coagulated at a temperature of about 25 to 27° C.

11. The method according to claim 7 wherein the chitin gel is cold pressed.
12. The method according to claim 11 wherein the chitin gel is pressed between glass plates.
13. The method according to claim 12 wherein the glass plates are lined with cellulose paper.
14. The method according to claim 13 wherein chitin gel is pressed under uniform pressure.
15. The method according to claim 11 wherein the residual solvent is removed by heating the film under press in a dry oven at about 50° C.
16. The method according to claim 15 wherein the chitin film is washed in ethanol at a temperature of about 27 to 30 ° C.
17. The method according to claim 1 further comprising the step of drying the washed chitin film under press.
18. The method according to claim 1 further comprising the step of calendering the chitin film prior to the step of removing residual solvent.
19. The method according to claim 18 wherein the chitin film is calendered between elastomeric rollers or steel rollers at a temperature of about 27 to 30° C.
20. The method according to claim 6 wherein the chitin solution is cast in a rectangular mold.
21. The method according to claim 20 wherein bottom surface of the mold is smooth.
22. The method according to claim 20 wherein bottom surface of the mold is rendered uneven.

23. The method according to claim 22 wherein the bottom surface is rendered uneven with serrations or mini spikes.

24. The method according to claim 20 wherein the chitin solution is cast to a height of about 10 mm.

25. The method according to claim 24 wherein the chitin solution is coagulated as chitin becomes insoluble with the uptake of moisture for about 24 hours at ambient temperature.

26. The method according to claim 25 wherein the chitin gel is cold pressed between glass plates lined with cellulose paper, under uniform pressure for about 24 hours.

27. The method according to claim 26 wherein the residual solvent is removed by heating the film under press in a dry oven at a temperature of about 50° C for about 12 hours.

28. The method according to claim 27 wherein the chitin film is washed in ethanol for 12 hours at ambient temperature.

29. The method according to claim 28 further comprising the step of drying the chitin film by cold pressing the film between plates lined with cellulose paper, under uniform force for 48 hours.

30. A method of forming an absorbent-matrix comprising the steps of mixing two or more polymer solutions to form a colloidal precipitate, dispersion or coacervate (matrix precursor), isolating the matrix precursor from the solution and drying the matrix precursor to form an absorbent-matrix.

31. The method according to claim 30 wherein the polymer solutions are carboxymethyl-chitin solution and chitin solution.

32. The method according to claim 31 wherein the concentration of each of carboxymethyl-chitin and chitin in each solution is about 0.1 to 10%.

33. The method according to claim 32 wherein the chitin solution is a solution of .1% chitin in 5% LiCl/DMAc.

34. The method according to claim 33 wherein the matrix precursor is isolated by filtration.

35. The method according to claim 34 further comprising the step of pouring the matrix precursor into a mold prior to drying.

36. The method to claim 35 wherein the matrix precursor is freeze dried by freezing at about  $-20^{\circ}\text{C}$  to  $-10^{\circ}\text{C}$  for about 12 to 24 hours and freeze drying at a pressure of about 700 milliT, a condenser temperature of about  $-50^{\circ}\text{C}$  and shelf temperature of about  $25^{\circ}\text{C}$  for about 24 hours.

37. A method of preparing a chitin film containing an absorbent-matrix comprising the steps of introducing an absorbent-matrix prepared according to claim 31 into a chitin solution, coagulating the chitin solution containing the absorbent-matrix to form a chitin gel containing the absorbent-matrix; pressing the gel to form a chitin film containing the absorbent-matrix; removing residual solvent from the film under press and washing the film.

38. A chitin film containing an absorbent-matrix prepared according to the method of claim 37.

39. The method according to claim 1 further comprising the step of introducing an absorbent-matrix into the chitin solution.

40. The method according to claim 39 wherein the absorbent-matrix is prepared according to the method of claim 31.

41. A chitin film which is about 25 to 75  $\mu\text{m}$  thick and possesses tensile strength of about 60 to 115 Mpa.

42. A chitin film which is about 25 to 75 um thick and possesses transparency of about 77 to 88%.

43. A chitin film which is about 25 to 75 um thick and possesses tensile strength of about 60 to 115 Mpa and transparency of about 77 to 88%.

44. The chitin film according to claim 43 wherein the film shrinkage is less than about 50%.

45. An absorbent-matrix-containing chitin film which is about 90 um thick and which is swellable.

46. The absorbent-matrix-containing chitin film according to claim 45 which swells to a thickness of about 1210 um.

8.23